

Claims

- [c1] An apparatus for use with a subsea well, comprising:
a carrier line spool having a carrier line that is adapted to be positioned underwater; and
a stack in a structure separate from the carrier line spool, the stack adapted to operatively couple to subsea wellhead equipment, and the carrier line attached to the stack.
- [c2] The apparatus of claim 1, wherein the carrier line spool comprises a coiled tubing spool.
- [c3] The apparatus of claim 1, wherein the carrier line spool is selected from the group consisting of a wireline spool and slickline spool.
- [c4] The apparatus of claim 1, wherein the carrier line spool is adapted to be positioned on the sea floor separate from the stack.
- [c5] The apparatus of claim 1, wherein the carrier line spool comprises a coiled tubing spool, the apparatus further comprising an injector head adapted to drive coiled tubing from the coiled tubing spool.

- [c6] The apparatus of claim 5, wherein the stack comprises the injector head.
- [c7] The apparatus of claim 6, wherein the stack further comprises a gooseneck to provide support for coiled tubing reeled from the coiled tubing spool.
- [c8] The apparatus of claim 5, further comprising at least one buoyancy tank attached to an assembly containing the injector head.
- [c9] The apparatus of claim 1, further comprising a carousel containing a plurality of intervention tools.
- [c10] The apparatus of claim 9, wherein the carousel is rotatable underwater to enable switching of tools for connection to the carrier line.
- [c11] The apparatus of claim 1, wherein the stack contains an emergency disconnect package.
- [c12] The apparatus of claim 11, further comprising a connector connected between the emergency disconnect package and the subsea wellhead equipment.
- [c13] An apparatus for use with a subsea well, comprising:
 - a carrier line spool having a carrier line that is adapted to be positioned underwater and to be operatively coupled to subsea wellhead equipment; and

an underwater marine unit adapted to operatively couple the carrier line to the subsea wellhead equipment.

[c14] The apparatus of claim 13, wherein the underwater marine unit comprises an umbilical line to receive command signals.

[c15] The apparatus of claim 13, wherein the underwater marine unit comprises an interface to receive wireless signals.

[c16] The apparatus of claim 15, wherein the wireless signals comprise acoustic wave signals.

[c17] A method of intervention with a subsea well, comprising:
positioning a carrier line spool underwater;
attaching a stack to subsea wellhead equipment, the stack in a structure separately located from the carrier line spool; and
coupling a carrier line of the carrier line spool to the stack.

[c18] The method of claim 17, wherein coupling the carrier line comprises coupling the carrier line to an injector head in the stack.

[c19] The method of claim 18, wherein coupling the carrier

line comprises coupling the carrier line through a goose-neck to the injector head.

[c20] The method of claim 17, further comprising lowering the carrier line into the subsea well to perform an intervention operation.

[c21] The method of claim 20, further comprising raising the carrier line after the intervention operation is completed and switching tools connected to the carrier line.

[c22] The method of claim 21, wherein switching tools comprises actuating a carousel system having chambers containing a plurality of tools.

[c23] The method of claim 22, further comprising engaging the carrier line with another tool after actuating the carousel system.

[c24] The method of claim 17, further comprising attaching intervention equipment separate from the carrier line to the subsea wellhead equipment.

[c25] The method of claim 17, further comprising using an underwater marine unit to couple the carrier line to the subsea wellhead equipment.

[c26] The method of claim 17, further comprising lowering, using an underwater marine unit, the carrier line spool to

a position on a sea floor.

- [c27] The method of claim 26, further comprising attaching buoyancy tanks to the carrier line spool to enable the underwater marine unit to carry the carrier line spool underwater.
- [c28] A method of intervention with a subsea well, comprising:
positioning a carrier line spool underwater;
coupling a carrier line of the carrier line spool to subsea wellhead equipment; and
using an underwater marine unit to couple the carrier line to the subsea wellhead equipment.
- [c29] The method of claim 28 further comprising communicating commands to the underwater marine unit using at least one of a control line and wireless signals.
- [c30] A subsea intervention method for use with subsea wellhead equipment, comprising:
assembling modules containing intervention equipment;
and
connecting, using an underwater marine unit, the assembled intervention equipment to the subsea wellhead equipment; and
attaching one or more buoyancy tanks to at least one of

the modules.

- [c31] The method of claim 30, further comprising attaching one or more buoyancy tanks to the assembled intervention equipment.
- [c32] The method of claim 30, wherein assembling the modules comprises assembling a carrier line spool as part of the intervention equipment.